What Is Claimed Is:

1. An isolated nucleic acid molecule encoding a pancreatic T-type calcium channel.

2. The isolated nucleic acid molecule of claim 1 wherein said nucleic acid is deoxyribonucleic acid.

3. The isolated nucleic acid molecule of claim 2 wherein said deoxyribonucleic acid is cDNA.

4. The isolated nucleic acid molecule of claim 3 wherein said nucleic acid molecule has a nucleotide sequence as shown in SEQ ID NO:1.

5. The isolated nucleic acid molecule of claim 1 wherein said nucleic acid molecule encodes an amino acid sequence as shown in SEQ ID NO:2.

6. The isolated nucleic acid molecule of claim 1 wherein said nucleic acid is ribonucleic acid.

7. The isolated nucleic acid molecule of claim 6 wherein said ribonucleic acid is mRNA.

8. An antisense nucleic acid molecule complementary to at least a portion of the mRNA of claim 7.

9. A cell comprising the antisense nucleic acid molecule of claim 8.

10. An expression vector comprising the antisense nucleic acid molecule of claim 8.

11. The expression vector of claim 10 wherein the expression vector is selected from the group consisting of a plasmid and a virus.

12. A cell comprising the expression vector of claim 10.

13. A method of decreasing expression of a pancreatic T-type calcium channel in a host cell, said method comprising introducing the antisense nucleic acid molecule of claim 8 into the cell, wherein said antisense nucleic acid molecule blocks translation of said mRNA so as to decrease expression of said pancreatic T-type calcium channel in said host cell.

14. A ribozyme having a recognition sequence complementary to a portion of the mRNA of claim 7.

15. A cell comprising the ribozyme of claim 14.

16. An expression vector comprising the ribozyme of claim 14.

17. The expression vector of claim 16 wherein the expression vector is selected from the group consisting of a plasmid and a virus.

18. A cell comprising the expression vector of claim 16.

19. A method of decreasing expression of a pancreatic T-type calcium channel in a host cell, said method comprising introducing the ribozyme of claim 14 into the cell, wherein expression of said ribozyme in

said cell results in decreased expression of said pancreatic T-type calcium channel in said cell.

20. A cell comprising the nucleic acid molecule of claim 1.

21. An expression vector comprising the nucleic acid molecule of claim 1.

22. The expression vector of claim 21 wherein said expression vector is selected from the group consisting of a plasmid and a virus.

23. A cell comprising the expression vector of claim 21.

24. A method of increasing expression of pancreatic T-type calcium channel in a host cell, said method comprising:

introducing the nucleic acid molecule of claim 1 into the cell; and

allowing said cell to express said nucleic acid molecule resulting in the production of pancreatic T-type calcium channel in said cell.

25. A method of screening a substance for the ability of the substance to modify T-type calcium channel function, said method comprising:

introducing the nucleic acid molecule of claim 1 into a host cell;

expressing said pancreatic T-type calcium channel encoded by said nucleic acid molecule in the host cell;

exposing the cell to a substance; and

evaluating the exposed cell to determine if the substance modifies the function of the T-type calcium channel.

26. The method of claim 25 wherein said evaluation comprises monitoring the expression of T-type calcium channel.

27. A method of obtaining DNA encoding a pancreatic T-type calcium channel, said method comprising:

selecting a DNA molecule encoding a pancreatic T-type calcium channel, said DNA molecule having a nucleotide sequence as shown in SEQ ID NO:1;

designing an oligonucleotide probe for a pancreatic T-type calcium channel based on SEQ ID NO:1;

probing a genomic or cDNA library of an organism with the oligonucleotide probe; and

obtaining clones from said library that are recognized by said oligonucleotide probe, so as to obtain DNA encoding a pancreatic T-type calcium channel.

28. A method of obtaining DNA encoding a pancreatic T-type calcium channel, said method comprising:

selecting a DNA molecule encoding a pancreatic T-type calcium channel, said DNA molecule having a nucleotide sequence as shown in SEQ ID NO:1;

designing degenerate oligonucleotide primers based on SEQ ID NO:1; and

utilizing said oligonucleotide primers in a polymerase chain reaction on a DNA sample to identify homologous DNA encoding a pancreatic T-type calcium channel in said sample.

29. An isolated nucleic acid molecule encoding a pancreatic T-type calcium channel, said nucleic acid molecule encoding a first amino acid sequence having at least 90% amino acid identity to a second amino acid sequence, said second amino acid sequence as shown in SEQ ID NO:2.

30. A DNA oligomer capable of hybridizing to the nucleic acid molecule of claim 1.

31. A method of detecting presence of a pancreatic T-type calcium channel in a sample, said method comprising:

contacting a sample with the DNA oligomer of claim 30, wherein said DNA oligomer hybridizes to any of said pancreatic T-type calcium channel present in said sample, forming a complex therewith; and

detecting said complex, thereby detecting presence of a pancreatic T-type calcium channel in said sample.

32. The method of claim 31 wherein said DNA oligomer is labeled with a detectable marker.

33. An isolated pancreatic T-type calcium channel protein.

34. The pancreatic T-type calcium channel protein of claim 33 wherein said pancreatic T-type calcium channel protein is encoded by a nucleotide sequence as shown in SEQ ID NO:1.

35. The pancreatic T-type calcium channel protein of claim 33 wherein said pancreatic T-type calcium

channel protein is encoded by an amino acid sequence as shown in SEQ ID NO:2.

36. An isolated pancreatic T-type calcium channel protein encoded by a first amino acid sequence having at least 90% amino acid identity to a second amino acid sequence, said second amino acid sequence as shown in SEQ ID NO:2.

37. An antibody or fragment thereof specific for the pancreatic T-type calcium channel protein of claim 36.

38. The antibody of claim 37 wherein said antibody comprises a monoclonal antibody.

39. The antibody of claim 37 wherein said antibody comprises a polyclonal antibody.

40. A composition comprising the pancreatic T-type calcium channel protein of claim 36 and a compatible carrier.

41. A method of detecting presence of a pancreatic T-type calcium channel protein in a sample, said method comprising:

contacting a sample with the antibody or fragment thereof of claim 37, wherein said antibody or fragment thereof binds to any of said pancreatic T-type calcium channel protein present in said sample, forming a complex therewith; and

detecting said complex, thereby detecting presence of a pancreatic T-type calcium channel protein in said sample.

42. The method of claim 41 wherein said antibody or fragment thereof is labeled with a detectable marker.

43. A method of modifying insulin secretion by pancreatic beta cells, the method comprising modifying levels of functional T type calcium channels in the pancreatic beta cells.

44. The method of claim 43 wherein modifying levels of functional T type calcium channels comprises modifying T type calcium channel gene expression in the pancreatic beta cells.

45. The method of claim 44 wherein modifying T type calcium channel gene expression comprises exposing the pancreatic beta cells to a compound which modifies T type calcium channel gene expression.

46. The method of claim 45 wherein the compound is an antisense oligonucleotide targeted to the T type calcium channel gene.

47. The method of claim 43 wherein modifying levels of functional T type calcium channel comprises exposing the pancreatic beta cells to an inhibitor of the functional T type calcium channel.

48. The method of claim 43 wherein modifying levels of functional T type calcium channel comprises exposing the pancreatic beta cells to a compound which interferes with membrane T type calcium channel formation.

49. The method of claim 43 wherein the pancreatic beta cells are present in a subject having type II diabetes.

50. A method of treating type II diabetes in a subject, the method comprising administering to the subject an amount of a compound effective to modify levels of functional T type calcium channel in the pancreatic beta cells of the subject.

51. The method of claim 50 wherein the compound modifies levels of functional T type calcium channel by modifying T type calcium channel gene expression.

52. The method of claim 51 wherein modifying T type calcium channel gene expression comprises exposing the pancreatic beta cells to a compound which modifies T type calcium channel gene expression.

53. The method of claim 52 wherein the compound is an antisense oligonucleotide targeted to the T type calcium channel gene.

54. The method of claim 50 wherein the compound is an inhibitor of the functional T type calcium channel.

55. The method of claim 50 wherein the compound interferes with membrane T type calcium channel formation.

56. A method of modifying basal calcium levels in cells, the method comprising modifying levels of functional T type calcium channels in the cells.

57. A method of modifying the action potential of L type calcium channels in cells, the method comprising modifying levels of functional T type calcium channels in the cells.

58. A method of modifying pancreatic beta cell death, the method comprising modifying levels of functional T type calcium channels in the pancreatic beta cells.

59. A method of modifying pancreatic beta cell proliferation, the method comprising modifying levels of functional T type calcium channels in the pancreatic beta cells.

60. A method of modifying calcium influx through L type calcium channels in cells, the method comprising modifying levels of functional T type calcium channels in the cells.